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GLOBALISATION, EUROPEANISATION AND METAGOVERNANCE: SOCIETY, SPACE AND TECHNOLOGY

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Abstract

The sovereign national state is in many respects a recent phenomenon. The settlements following both world wars in the twentieth century created and defined our current understanding of the nation. They also qualified the concept by creating supra-national levels of accountability for both governments and individuals.

With advancing globalisation, both the freedom of action and the legitimacy of national states are under pressure from the supra-national regulators of the world economy, such as the WTO. Traditional means of protecting and developing sub-national regions and national interests through government support and intervention are no longer legitimate. Against decline in participation in local and national elections, individuals and regions can appeal directly to supra-national entities.

Nevertheless, the information and communication technology driving the global economy also provides an opportunity for nation states to re-connect with their citizens through new electronically mediated relationships. Policy formulation and delivery of services need no longer be a top down process, but can pursue subsidiarity through direct electronic forms of engagement with the consumers of public services and those towards whom public policies are directed.

Elements of this new polity are already in place, not least within the enlarging European Union, and this paper reflects on emergent practices which could deliver electronic metagovernance for the redefined 21st century state.

Textures of Globalisation

Interest in the governance of governance – metagovernance – reflects dramatic changes in the bargaining power and indeed will to power of the nation state over the last thirty years. The promotion of command economy, mixed economy and free-market economy reflected ideological positions rendered irrelevant by the end of the Cold War in the closing decades of the twentieth century. The cessation of crypto-hostilities led to the end of what

several writers have termed a “bi-polar discipline” (Ohmae, 1995). The removal of constraining ideological blocs was followed by accelerating attempts at global economic integration characterised by the “strong globalisation” view typified by Kenichi Ohmae (1990). In Ohmae’s view globalisation is dominated by a core “triad” of economic regions: North America, Western Europe and North East Asia (predominantly Japan) which share the bulk of international trade. Global production and consumption is seen as a series of complementary flows of materials from periphery to centre and products from centre to periphery. This view is influenced by the development of multi-domestic production close to the peripheral markets (Dicken 1998). This centripetal model still has value in tracking paths of diffusion and assimilation, as with the movement of textile production from the developed core, such as the U.K. to the providers of the raw materials, such as India.

Often “Globalisation” is presented as a novel and irresistible logic leading to the unproblematic technological transformation of economic relationships. To understand the prospects for local interventions to produce any impact on such a system, it is necessary to consider the drivers of current change and the opportunities for particular directions of development that they provide.

The internationalisation of trade can be traced deep into history, beyond the establishment of the Silk Road. The western mercantile tradition developed around a set of technologies which Hirst and Thompson (1996) argue had reached a functional plateau with the reliability and regularity of the steamship and electric telegraph by the conclusion of the nineteenth century. Certainly pre-First World War international trade shares characteristics with later forms of trans-national commerce. However, the current presentation of globalisation represents an ideological interpretation of significant technological changes.

The recent driver of globalisation has been the reduction of transaction costs achieved through ICTs which replaces a production or supply “chain” with much more densely networked patterns. The dynamics of the underlying information and communication technologies mean that the focus of attention

has shifted from flows of material to flows of information and knowledge. As a result disparate national and regional cultures are becoming increasingly interlinked within networked and globalised organisations. Production and consumption of goods and services take place in an increasingly complex web, where both sophisticated and commodified products may be produced and consumed at centre and periphery. More significantly, the “Fordist compromise”, which required manufacturing activity to be matched by co-located consumption has been rendered irrelevant (Lipietz, 1992). It has become possible to minimise the cost of labour by separating producer and consumer.

However, there is also growing evidence of the exclusion of economically marginal performers. Only specifically favoured geographical areas or economic sectors may benefit from integration into what is still a partial global economy. Smaller economies and enterprises may gain little, finding instead that incoming foreign capital may demand resources that are diverted from development (see Dicken 1998). In post colonial societies the information and telecommunications infrastructure is likely to be optimised for a external agenda, to the detriment of their potential to address internal imbalances.

Differences between centre and periphery and between large and small scale economic activity is critical to an understanding of the impact of globalisation and its supporting technologies at particular locations. Ohmae (1995) celebrates such variation as evidence of the need to pursue “zebra strategies”. These imply cross-border development playing to the relative strength of the most developed components of separate national economies in order to create regional synergies. These strategies are directed at only the strongest parts of a regional economy, in order to create sufficient levels of formal economic activity for inclusion in the world system. Such differential development could become entrenched within a global infrastructure driven by the priorities of the dominant developed economies. The stresses of adjustment and realignment between economies, added to the reinforcement of existing inequities of development have led to a corresponding growth of

economic migration, both, internal and trans-national, legal and illegal, which threatens the stabilities of economies at either end of the traffic.

However, as Delamaide (1994) points out, several of the accession economies entering an expanding European Union are re-establishing older geo-political partnerships interrupted by Cold War divisions. For Delamaide the patterns of potential development across an enlarging European Community can be mapped on to a range of geo-historical connections dating back to the Hanseatic League or the Holy Roman Empire.

Similar enduring cultural links, whether established through trade, migration or colonisation can be identified throughout the emergent global system. Post-colonial relationships provide one form of connection, language another. Nobes and Parker (1981) trace variation in accounting practice across the globe to the initial development of modern accounting in Scotland and England, its subsequent spread though other Anglophone cultures. Turkey has recently re-established links with the Turkic republics of the former USSR. The influence of Japan's colonial presence has contributed to the character of national development in both Taiwan and Korea, though with different outcomes.

Chains and Networks

Inspired by the new organisational relationships made possible by the merging of computer and communication technologies (ICTs), observers such as Negroponte (1995) and Mitchell (1996) argue for the transformative potential of new forms of networked organisation and "virtual workplaces" unlike anything previously possible.

New locational strategies allowed white collar work from the US mainland to be relocated off-shore to the Caribbean as far back as the 1980s, and "front office" tasks in prestigious locations have been divided from "back office" tasks relegated to the more local periphery of outer suburbia. Less developed regions find themselves increasingly in competition for such lower value work, and their infrastructure is likely to be developed primarily to support it. At the same time, potential consumers with limited economic resources are less able to influence the direction of development of technologies, artifacts and services which are targeted at the most lucrative component of global markets. Across the new networked economy as a whole

research and development, raw materials sources and routine manufacturing, final assembly, markets and after-market support, are increasingly co-located. The emergent global system is one of complex inter-penetration of peripheries and cores and these terms now refer to competence in the underpinning information and communication infrastructure, rather than physical location.

Entrants to the global marketplace from East Asia quickly became aware of the need to exploit their presence in the established economies. James and Howell (2001) show that Asian companies are establishing or acquiring research and development (R & D) facilities within the United Kingdom and the United States. There are two motives for this. Knowledge of regional markets can be gained via partnership or part ownership followed by acquisition. It can also be captured through R & D focussed on local product development, informed by feedback from local customers and incorporated into regionally targeted products. At the same time, access to a broader intellectual capital base can be obtained through tapping into regional knowledge which might enhance home-based operations. Both Malaysian and Korean automotive companies have acquired British-based engineering and design companies to further develop their home capabilities. Silicon Valley has attracted not just North American but Asian and European entrepreneurs. The incomers' strategy is to create a point of presence for networks that reach back to their home locations in India, Taiwan or France. These previously disconnected networks can then access intangible as well as tangible resources.

The shifting balance between physical and electronic adjacency facilitated by information and communications technologies has led organisation theorists to describe new organisational forms. The rise of the Internet and e-commerce as facilitators of trans-national commerce has led to a range of formulations of "networked organisation". Castells has described such networks in his Informational City, a "space of flows", arguing that access to flows of information and resources is the key to participation in the wider economy (Castells; 1989). For Castells, success requires a subtle interaction between physically co-located resources and information-based resources. However, two decades earlier Webber proposed the "city as

communications system", (Webber; 1964, p.84) in order to switch the emphasis of urbanity from physical built form to the quality of interaction in cultural life through the exchange of information. Webber formulates "non-place community" in terms of Interest-Communities. Accessibility, rather than the propinquity aspect of "place" being the necessary condition for this form of community (Webber; 1964). He argues that this definition implies that suburban and exurban dwellers enjoy a measure of urbanity not previously acknowledged: the traditional "place community" was in fact a special case of a larger genus of association. For Webber individuals are involved in an overlapping set of communities which involve different social and physical spaces.

Links and Nodes

Castells (1989) describes the complex web of relationships necessary to sustain this level of multi-disciplinary knowledge creation as a 'creative milieu'. Such a milieu extends beyond the boundaries of the high-tech firms themselves into a hinterland of rich knowledge resources, involving universities, sympathetic financial institutions and a highly sophisticated labour market. Silicon Valley start-up companies can secure both finance and personnel from their environment and draw upon a highly skilled and mobile workforce. However, the highly specialised labour market was originally created by an outflow of personnel from the larger, established companies and from universities, particularly Stanford.

Webber's view of a non-place realm explains the way in which the Internet and related ICTs offer smaller players access to resources from and partners within global networks, and there are examples of such successful initiatives. Inoue (1998) describes a "virtual village" in which small enterprises are able to form and reform alliances in order to provide high technology services to larger companies. Their physical co-location across a number of inner suburbs of Tokyo is enhanced by electronic exchange. A more dramatic form of electronic adjacency has been created by the London-based supporters of Sohonet. A group of specialised media companies shares high capacity data links in order to participate in the creative milieu based around Hollywood and West Los Angeles. The high-speed digital exchange of film,

video and sound enables post production operations to be carried out in London, in direct competition with Californian companies. The open networked nature of the entertainment industry of Southern California is a replication of the IT networks in Northern California. Through the rapidly increasing use of technologies such as computer generated images (CGI) and the on-line promotion and delivery of content, the Los Angeles region is moving towards convergence with its northern neighbour.

Such striking innovations appear to alter the relationship between organisational size and performance. The contemporary notion of the “network organisation” and decreasing Internet costs appear to present an opportunity for smaller players to access resources from and to compete within global networks. However, using the reduction on transaction costs delivered by ICTs, larger firms can restructure to enter niche markets yet still draw on their wider resource base. Castells (1996) describes a form of “network enterprise” which is composed of components of larger corporations, collaborating in specific spatial and temporal circumstances, while the main companies are still pursuing global strategies of direct competition. Castells is describing a mechanism by which larger corporations can achieve some of the agility of smaller competitors. While additional accessibility and flexibility is also available to smaller players, larger firms can restructure into networks which can enter niche markets yet still draw on their wider resource base, presenting a formidable challenge to smaller and medium scale players. The complexity of such webs and n

The State bows out

The diffusion of state power through agreement to and participation in multilateral regulation in areas such as trade, security and environment has been matched by the emergence of trans-national corporations operating in internationalised financial and labour markets (Camilleri and Falk; 1992). By the last quarter of the twentieth century massive investment in technology, especially information and communication technology, and its production had produced significant changes in the dominant model of the trans-national corporation.

This shift to more open, networked relationships is encapsulated in Saxenian's comparison between Route 128 and Silicon Valley (Saxenian 1994). Route 128 around Boston emerged as a centre of high technology industries in the 1960s. The East Coast paradigm relied upon established companies and a new relationship with universities and central government, the core of President Eisenhower's "military-industrial complex". The closed nature of these large, individual organisations contrasts with the densely networked environment of the more dynamic West Coast firms. Silicon Valley is dominated by the loosely networked companies which grew up with the new technologies they promote.

By the turn of the century the vertically integrated multinational corporation, under unified ownership, had been superseded by networks of externalised relationships between associated but often autonomous firms. The centripetal model of international flows of assets and capabilities over time from an innovating centre to a periphery dealing with mature activities was unable to account for the intensely networked and distributed global system which had emerged. Notions of technological diffusion and technology transfer were displaced by the need to network, and Silicon valley was the embodiment of this.

Despite its free-wheeling entrepreneurial milieu and anti-statist, free enterprise rhetoric, Silicon Valley was as dependent upon public sector, defence related expenditure for its genesis as Route 128 had been a decade earlier. The Silicon Valley paradox is that much of the robustness and ease of use of Internet based applications, a key to their rapid commercial dissemination in the run up to the millennium, can be traced to the requirements of large public sector institutions. This was a lesson better learned by the developmental nation states of East Asia, Singapore, Taiwan and Korea in particular (see Thorpe & Little, 2001).

Even informed and sincere imitators of Silicon Valley face the problems of reproducing an adequate or equivalent set of conditions as described by Castells and Hall (1994) in their global survey of attempts to kick-start high technology centres. Regional and national disparities in access to resources and capabilities still present real problems, even in the case of the better

judged efforts, such as Malaysia's bold attempt at the creation of a Multi-Media Super-Corridor to connect the country to global high technology production (Wilkinson et al, 2001). The move from high quality but relatively low value routine production to cutting-edge innovation is one that requires both technical and cultural re-orientation and a shift in perception by both actors and observers. The Malaysian government itself is ambivalent about the impact on national identity and cohesion of the level of Internet access expected by potential inward investors. Little, Holmes and Grieco (2001) describe some of the social and political impacts on Malaysia's economy.

Morgan (2001) argues that a naïve view of the dynamics of clustered companies, as seen in Silicon Valley assumes that such conditions can be created, almost to order, by regional development agencies. The notion of regional clusters still dominates thinking at regional level within the European Union and in other jurisdictions. Morgan mounts an argument for the proper consideration of geographical location in terms comparable to Delamaide's (1994) concern for historical relationships. Morgan cites the literature of innovation studies which emphasises the particularity of paths of development and diffusion (Dosi and Marengo, 1994, Edquist, 1987). In the wider discussion of the problematic of current regional policies, the concept of "glocalization" describes both the balancing that has to be struck between global engagement and local adjustment by regions (Swyngedouw, 1997) and the adaptive strategies of multinationals (Morris 1991).

Infrastructure: Marketplace and Milieu,

Privatisation of infrastructure, often starting with national telecommunication carriers, has created an export market for infrastructure management in electricity, water, highways and telecomm, within and between the developed economies, reaching out to the developing economies. This has initiated an abdication of national governments from a developmental role in favour of a more regulatory role. Jessop (2002) presents this as a shift from government to governance. The emergence of Public- Private Partnerships, Private Finance Initiatives and current accounting practices controversy such as the Enron scandal align with governance issues: the rolling back of the state as a service provider and the

consequent expansion of its role as a regulator enlarge the space for metagovernance. In areas where the state had previously occupied a position of direct control, it must now govern indirectly. Public scepticism over the equity of the apportionment of risk in public projects represents present social unease with the development of this metagovernance framework.

The privatisation and/or corporatisation of national telecommunications carriers and broadcasters and the introduction of market competition also means a loss or reduction of the redistributive, social role implied by such public monopolies. While many de-regulated carriers retain some role in providing universal access, the issue of “information asymmetries” (Lamberton 1995) must be considered.

The informal replacement of national broadcasters by extraterritorial organisations using direct satellite broadcasting has taken place in parallel with telecommunications deregulation. The policies which result in specific technological strategies are increasingly determined at supra-national levels.

In most countries, local governments must now compete for the early availability of new communication resources in the twenty-first century just as they competed for access to railway routes in the nineteenth. This process has been taking place as the infrastructure involved became central to economic opportunity.

Information networks are emerging as the social milieu of non-place communities. However, the ubiquity of the base technology means that access to non-place community does not depend on large investment, nor on esoteric technical skills, a point sometimes missed in otherwise justifiable criticism of technological optimism. Access should not be confused with ownership, and the suburbs of developing cities such as Accra contain business centres and internet cafes which allow some practical participation in global information flows.

Local, Global and Glocal

The growing maturity of the contributing technologies means that relatively stable standards are emerging, allowing both commodification (and consequent cost reduction) of components and the diffusion of appropriate technical literacy and skills among the general population.

However, the difficulty of achieving effective communities of practice across both spatial and cultural distance is already being identified in studies of attempts by western firms to capitalise on the resources of the Indian software industry (Nicholson, Sahay & Krishna, 2000). The prospect of seamless interoperability between remote locations fell foul of the definitions and practices demanded of a local identity. Where Indian firms are successfully providing services in Europe and North America they either have key staff in place in the client culture in order to ensure cultural adjustments are made, or they operate via partnerships. In approaching the Japanese markets Indian firms are taking care to align with local practices (Nikkei, 2001)

The growing separation between intellectual capital and physical production has consequences for both core and peripheral economies. Lipietz (1992) argues that the ability to separate production from consumption in these systems signals the end of the “Fordist compromise” which underpinned the Keynesian social-democratic paradigm. Harvey (1990) points out that Ford significantly increased wages when he introduced his five-dollar, eight-hour day in 1914 in conjunction with his production line. He saw the workers as an integral part of a production and consumption process. Production workers remote from the destination market no longer need to be paid sufficiently well to consume the products of their own labour. The result of these changes is a complex layering of labour markets, both internal and external to the developed economies driving the globalisation process. Harvey regards this post-Fordist situation as a regime of flexible accumulation which is tightly organised through its geographical dispersal and flexible responses to labour markets, and which is even more reliant on the creation of scientific and technical knowledge.

The nature of employment has been changed in both the established and the newly participating economies. Castells (1996) characterises this as the replacement of *organisational man* with *flexible woman*, and Beck (2000) speaks of the “Brazilianisation of the West”. Castells is arguing that the North American fifties stereotype of the white-collar worker with the western equivalent of life-time employment in a large corporation is being replaced by the short-term contract worker, often female, who may gain some advantage

from flexible working hours, but who is inevitably on a lower level of remuneration and benefits. Beck goes further to argue that the patterns of employment, common to semi-industrialised countries typified by Brazil are the future for developed countries. He bases this judgement on the impact of current neo-liberal economic policies which deny any developmental role for the national state, relying instead entirely on market mechanisms. Bond, for example, analyses the implications of adherence to such policies in post-apartheid South Africa (Bond, 2000). A minority of waged or salaried full time workers will coexist with a majority of multi-activity workers following a variety of discontinuous and unregulated sources of income. Such a scenario is far removed from the lifetime employment model of the major Japanese corporations, or even of recent western practice and assumptions.

Naomi Klein characterises focus on higher value activities by what were formerly manufacturing organisations as a shift from material production to a form of cultural production (Klein, 2000). She argues that the apparent global expansion of high profile brands is in fact accompanied by a downsizing or hollowing out in which all functions except the management and development of the brand itself are subcontracted. This represents the apotheosis of outsourcing facilitated by both a reduction of transaction costs and the alteration of the relative advantages and economies of size. Production of whatever artefact is chosen to re-embody the disembodied brand can be undertaken at the most cost advantageous location, remote from its ultimate consumers. Ultimately brands may become the carrier of the core values and emotional capital of what were once physically extensive organisations that have been reduced to sets of networked relationships. The brand, commodified through franchise operations may represent the core resource of such a global network, the only means by which it can be readily recognised by the target consumer. The management of organisational values and brand equity and value are likely to become a central issue for the maintenance of communities of practice and coherence of networked organisations

Beyond the State

The demonstrations against the World Trade Organisation in Seattle, and subsequent events in Prague and Stockholm represent one set of reactions to these shifts from government to governance and the impact on communities which derive their identity from economic activities now under threat. Kanbur (2001) argues that they also reflect a perception that the activities of the Bretton Woods institutions, including the World Bank and International Monetary Fund, are increasing rather than reducing global poverty and inequality. For Kanbur a Group A mentality on the part of the governments and international institutions clashes with a Group B view of the non-governmental opponents (NGOs). Conflicting views of the appropriate level of aggregation at which to gauge progress, of the appropriate time horizon that should be addressed, and of the nature of markets structures and power relationships ensure that agreement is impossible. NGOs stress the short term effects on actual communities of medium-term focussed policies, while environmentalists stress the much longer term sustainability of policies. Both sides disagree upon the nature and function of market mechanisms, with the NGOs perceiving substantial market power accruing to large scale established players.

The key technologies of the Internet and World Wide Web do offer opportunities for voices and visions from geographically disparate locations to enter the world of global communication. These can build a dynamic between traditional cultural practices, modern communication forms to provide an enrichment of global symbolic life. There is a symbiosis between the use of the Internet for e-commerce purposes and the maintenance of living and differentiated cultures, a pattern which is already evident in Canada, Africa and Indonesia (Little, Holmes & Grieco, 2000).

Castells has described “informational politics in action” (Castells 1997 p.333). He is concerned that one aspect of globalisation, the reliance on simplified mass communication, inevitably reduces the complexity of political discourse. However, in the same volume he describes very different and complex forms of electronically mediated communication by dissident minorities: Zapatista rebels in Mexico and Militia groups in the U.S.A. In both

cases movements premised on the championing of the local and specific and a rejection of the global economy are achieving a presence and a voice in a global arena through the appropriation of the technologies of globalisation. The Mexican Federal Government itself provides links to independent and critical coverage of events via its own web-site, shifting political discourse into cyberspace and in front of a limitless audience (Little, Holmes & Grieco 2000)

In Japan, the Internet has been widely used for political debate, for example over airport location and development in the Kansai region. The Japan Local Government Center has set up a site through which it links with local governments globally to explore solutions to new urban problems.

On-line electronic petitions systems have been established in Scotland (see Griffin, this issue) and for the UK as a whole. SMS text as well as traditional postal voting has been trialed at local government elections in an attempt to increase voter turnout.

Providing grassroots access to the ICT domain has been identified as a means of reducing the cost of health and educational servicing, as with the current planned expenditure in the U.K. National Health Service (Cross, 2002). However, the channels established electronic commerce and for top down monitoring of public sector performance create new forms of bargaining. The transaction costs for the least powerful to gain visibility are also greatly reduced.

In California the notion of “community informatics” has been used to justify the provision of access to information previously freely available, but increasingly commercialised (Pitkin 2001). Across Europe city governments are co-operating across national borders through fibre optic technologies and other forms of electronic networking in the identification of municipal problems shared and solutions sought. Similarly within the European Union locations along particular lines of transport communication have begun to co-operate electronically in the management of traffic. The models of networking already present in the real world counter the view that global communication flatten cultural terrain in favour of the dominance of modes and material practices

determined by global economic leaders, most particularly the United States (Little, Grieco & Holmes, 2001).

Along with US ownership of the strategic components of global communication technology, most particularly the dominance of Microsoft, the emergence of English as a global language is seen as an important element in this flattening of the terrain. Such a view cannot be entirely discounted but it ignores many of the new cultural capacities of new forms of global communication. Just as Crystal (1997) argues that the global English language is no longer under the control of its original native speakers, so are the technologies of globalisation appropriated by users at the margins.

Beyond Governance

New technology can assist the civic empowerment of the individual in relation to the state and also the capability of remote locations to influence the world of global government and global commerce: there are now powerful electronic counterbalances to historical policy remoteness. Networking small states and islands through a combination of new technology and face to face meetings can generate new economic and social structures within global functioning. Miller and Slater (2000) explore the question of local improvisations in the case of Trinidadian diaspora: "Indeed the significance of studying the Internet is the degree to which it transcends dualisms such as local against global. It forces us to acknowledge a more complex dialectic through which specificity is a product of generality and vice versa" (Miller and Slater p. 7). Trinidadians undertake a distinctive set of social activities on the global Internet. What they experience are specific and local practices at a remote location. Malta, with a population of 420,000, the smallest of the accession states of the European Union, has a much bigger virtual presence as the centre of another diaspora.

The rise of the portal metaphor as an organiser of web access has allowed countries such as Estonia, to provide public access in its own Finno-Ugric language (Abbate, 2000). The use of "front-end" translation software can now overcome the language barrier. The portal is a home page which provides structured links into resources appropriate to its users. As an organising device it can reduce search time for newer users. The World Bank

recognised the role of knowledge in the 1998-99 "World Development Report" (World Bank, 1998) and is currently re-branding as the Knowledge Bank. Stephen Denning, as Director of Knowledge Management for the Bank has presented this as a necessary dialogue between all parties concerned with development process (Denning and Grieco, 2000). A component of this realignment is the development of a web portal for Global Development Knowledge. The Bank has opened a web-based debate with non-governmental organisations which has inevitably raised the issue of power relationships. These can be seen in the framing of access pathways by the resource rich on behalf of the resource poor.

The emerging global system is far from complete and far from determined, but it has already had a profound impact on social and working life in the regions included within and excluded from it. Information and communication technologies are driving the distributed processes of globalisation. By providing new forms of adjacency they are also providing avenues of entry for excluded constituencies and the means to refine and develop the management of the knowledge which has been foregrounded by the new relationships.

The speed of change in markets, competition and technology means that there is a socio-institutional lag as the new techno-economic paradigm emerges (Perez, 1983). For example, e-commerce is already mutating into m-commerce: mobile delivery of services. Despite the relative inadequacy of current WAP (Wireless Application Protocol) mobile telephony, the combination of low earth orbit (LEO) satellites with Global Positioning Systems (GPS) in proposed systems such as the European Galileo GPS will allow location-sensitive services to be delivered to individuals and groups on the move (Taplin, 2000). Wireless broadband has made an appearance where fibre-optic infrastructure is not available.

New forms of community of practice may arise, together with a reassessment of the spatial dynamics of knowledge creation and application. With LEO direct satellite systems, the network coverage will of necessity be equally dense and universal across the majority of the planet's surface beneath the hundreds of orbiting satellites. The lag presents an opportunity to

develop and demonstrate forms of metagovernance from within and between communities themselves

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